

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS

--1. (Currently Amended) A data modulation method comprising the steps of:

encoding transmission data in a data symbol;

inserting a reference symbol in which multiple synchronizing patterns are aligned in time series in order to contain a structure of

IA-A-IA-A-A-IA-A-IA-IA

(where: IA is a phase-shifted synchronizing pattern A) into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems; and

modulating the data symbol in which said reference symbol is inserted with radio frequency signals.

--2. (Previously Presented) The data modulation method according to claim 1, wherein said step of modulating the data symbol comprises conducting the modulation according to an orthogonal frequency division multiplexing (OFDM) system.

--3. (Currently Amended) A data modulation method comprising the steps of:

encoding transmission data in a data symbol;

inserting a reference symbol in which multiple synchronizing patterns are aligned in time series to contain a structure of

A-IA-A-IA-IA-A-IA-A-A

(where: IA is a phase-shifted synchronizing pattern)
into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems; and

modulating the data symbol in which said reference symbol is inserted with radio frequency signals.

--4. (Previously Presented) The data modulation method according to claim 3, wherein said step of modulating the data symbol comprises conducting the modulation according to an orthogonal frequency division multiplexing (OFDM) system.

--5. (Currently Amended) A data modulation method comprising the steps of:

encoding transmission data in a data symbol;

inserting a reference symbol in which multiple synchronizing

patterns are aligned in time series in order to contain a structure of

IB-IB-IB-IB-B-B-B-B-IB

(where: IB is a phase-shifted synchronizing pattern B)
 into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems; and

modulating the data symbol in which said reference symbol is inserted with radio frequency signals.

--6. (Previously Presently) The data modulation method according to claim 5, wherein said step of modulating the data symbol comprises conducting the modulation according to an orthogonal frequency division multiplexing (OFDM) system.

--7. (Currently Amended) A data modulation method comprising the steps of:

encoding transmission data in a data symbol;
 inserting a reference symbol in which multiple synchronizing patterns are aligned in time series in order to contain a structure of

B-B-B-B-IB-IB-IB-IB-B

(where: IB is a phase-shifted sync pattern B)

into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems; and

modulating the data symbol in which said reference symbol is inserted with radio frequency signals.

--8. (Previously Presented) The data modulation method according to claim 7, wherein said step of modulating the data symbol comprises conducting the modulation according to an orthogonal frequency division multiplexing (OFDM) system.

--9. (Currently Amended) A data modulation device comprising:
encoding means for encoding transmission data in a data symbol;

reference symbol insertion means for inserting a reference symbol in which multiple synchronizing patterns are aligned in order to contain a structure of

IA-A-IA-A-A-IA-A-IA-IA

(where, IA is a phase-shifted synchronizing pattern A)
into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication

systems; and

modulation means for modulating the data symbol in which said reference symbol is inserted with a wireless frequency signal.

--10. (Currently Amended) A data modulation device comprising:

encoding means for encoding transmission data in a data symbol;

reference symbol insertion means for inserting a reference symbol in which multiple synchronizing patterns are aligned in time series in order to contain a structure of

IB-IB-IB-IB-B-B-B-IB

(where, IB is a phase shifted synchronizing pattern B)
into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems; and

modulation means for modulating the data symbol in which said reference symbol is inserted.

--11. (Currently Amended) A communication device comprising:
encoding means for encoding transmission data in a data symbol;

reference symbol insertion means for inserting a reference

symbol in which multiple synchronizing patterns are aligned in time series in order to contain the structure of

IA-A-IA-A-A-IA-A-IA-IA

(where, IA is a phase shifted sync pattern A)

into said data symbol, said reference symbol producing a two peak waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems;

modulation means for modulating the data symbol in which said reference symbol is inserted with a radio frequency signal;

an antenna for receiving/transmitting a modulated signal; and

synchronization detection means for obtaining a correlation value between the reference symbol of the modulated signal received and a delayed reference symbol and detecting a synchronization.

--12. (Currently Amended) A communication device comprising:
encoding means for encoding transmission data in a data symbol;

reference symbol insertion means for inserting a reference symbol in which multiple sync patterns are aligned in time series in order to include a structure of

IB-IB-IB-IB-B-B-B-B-IB

(where, IB is a phase shifted sync pattern B)

into said data symbol, said reference symbol producing a two peak

waveform output when said reference symbol is input to a correlator of a receiver, thereby producing a distinguishable waveform pattern from other waveform patterns produced by other communication systems;

modulation means for modulating the data symbol in which said reference symbol is inserted with a radio frequency signal;

an antenna for receiving/transmitting a modulated signal; and

synchronization detection means for obtaining a correlation value between the reference symbol of a modulated signal received and a reference symbol delayed and detecting synchronization.--